

## PATENT ABSTRACTS OF JAPAN

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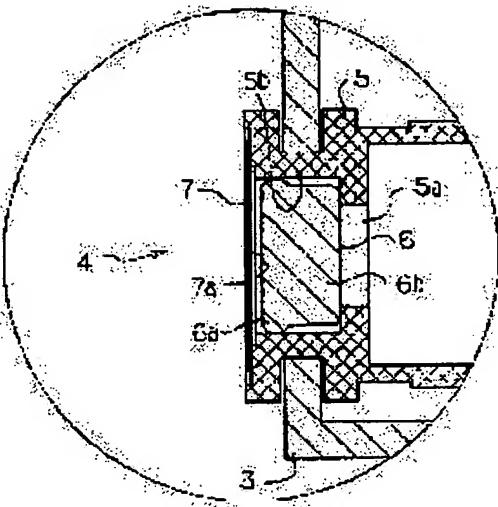
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## (54) INK CARTRIDGE

## (57)Abstract:

**PROBLEM TO BE SOLVED:** To obtain an ink cartridge in which an elastic sealing material can be prevented from being drawn out together with an ink supply needle and high sealing performance can be sustained over a long term.

**SOLUTION:** An elastic sealing material 6 is fitted in a tubular member 5 bonded to an ink bag and a tape material 7 is applied to cover the open end side of the tubular member 5. The tape material 7 has a surface layer 7a of substantially same material as the tubular member 5 and the surface layer 7a of the tape material 7 is deposited on the tubular member 5. The tape material 7 having high bonding power prevents the elastic sealing material 6 from being drawn out from the inside of the tubular member 5. Furthermore, enclosed state is sustained over a long term and the air is prevented from being mixed into the ink.



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**CLAIMS****[Claim(s)]**

[Claim 1] The ink container which stores ink It fixes in this ink container and they are ink feed holes. It is the ink cartridge equipped with the above, and it has the tape material which is welded at the open end section side of the aforementioned tubed part material, and holds the aforementioned elastic sealant in tubed part material, the aforementioned tape material has the surface layer of this quality of the material mostly with the aforementioned tubed part material, and it is characterized by welding this surface layer at tubed part material.

[Claim 2] The surface layer of the aforementioned tape material and tubed part material are an ink cartridge according to claim 1 which consists of material which makes polypropylene a principal component.

[Claim 3] Furthermore, the aforementioned ink container is an ink cartridge according to claim 2 which is formed in a flexible saccate, has the tapetum which becomes inner skin from the material which makes this quality of the material a principal component mostly with the surface layer of the aforementioned tape material, and is welded in this tapetum at tubed part material.

[Claim 4] The aforementioned elastic sealant is an ink cartridge according to claim 1 to 3 which makes rubber-like material of gas impermeability a principal component.

[Claim 5] For the aforementioned elastic sealant, the length of the insertion direction of an ink supply needle is the ink cartridge according to claim 1 to 4 made into about 40 or less times of the thickness of tape material.

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## DETAILED DESCRIPTION

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### [Detailed Description of the Invention]

[0001]

[The technical field to which invention belongs] this invention relates to the ink cartridge which stores the ink supplied to an ink-jet formula print head etc.

[0002]

[Description of the Prior Art] The tubed part material 102 (the so-called spout) fixes to the ink bag body 101 which stores ink so that it may be shown in the former, for example, drawing 7. The elastic sealant 103 (for the diameter of 7mm) which intercepts a free passage with the exterior of the ink bag body 101, and the interior in this tubed part material 102 By 6.5mm in thickness being fitted in, fixing the tubed part material 102 to one lateral portion of casing 104, coming to hold the ink bag body 101 in this casing 104, and inserting the ink supply needle 105 in the elastic sealant 103 The ink cartridge 106 which drew the ink of the ink bag body 101 interior outside is known through the aforementioned ink supply needle 105.

[0003] Although it is necessary to draw out the ink supply needle 105 from the elastic sealant 103 in the cases, such as exchange of this ink cartridge 106, since the adhesion of the elastic sealant 103 and the ink supply needle 105 is high, in case the ink supply needle 105 is drawn out, the elastic sealant 103 also has a possibility that it may be drawn out out of the tubed part material 102, together with the ink supply needle 105.

[0004] Then, as shown in drawing 8, in order to prepare heat caulking 102a which a part of inner circumference section of the tubed part material 102 is jutted [ a ] out inside, and comes to carry out melting solidification and to raise sealing performance further for the omission stop of the elastic sealant 103, carrying out heat welding of the seal tape 107 is performed on the upper surface of the open end section of the tubed part material 102.

[0005]

[Problem(s) to be Solved by the Invention] However, with the structure of preparing heat caulking 102a such, the technical problem that the work which gives heat caulking 102a to the inner circumference section of the tubed part material 102 is troublesome, and it is inferior to manufacture efficiency occurs. Moreover, although the seal tape 107 is formed in order to raise sealing performance, it cannot say that the welding force over the tubed part material 102 is low, and the effect of preventing the omission stop of the elastic sealant 103, and the effect of maintaining a sealing state and preventing mixing of the air to ink are enough. Air serves as air bubbles in ink, and causes non-\*\*\*\* of the print head of an ink-jet formula.

[0006] By the way, although preparing film members, such as a metal, ceramics, glass, and a resin, in the upper-limit side of ink output port where the ink rubber stopper which seals ink is fitted in is indicated by JP,1-180351,A, without performing a heat caulking It does not pass. this film member is prepared in order that air may prevent carrying out the dissolved dissolution to the inside of ink -- \*\*\*\* -- The welding force over ink output port (tubed part material) is weak like the case where the seal tape 107 mentioned above is used. Too, in case an ink supply needle is drawn out, it cannot regulate that an ink rubber stopper (elastic sealant) is drawn out from ink output port together with an ink supply needle.

[0007] In case this invention was made in view of this point and draws out an ink supply needle, it aims at offering the ink cartridge which can prevent that an elastic sealant falls out together with an ink supply needle.

[0008]

[Means for Solving the Problem] The tubed part material which invention of a claim 1 fixes in the ink container which stores ink, and this ink container, and has ink feed holes, By having the elastic sealant which is fitted in into this tubed part material and intercepts a free passage with the ink container exterior and the interior, and an ink supply needle being inserted in ink feed holes through the aforementioned elastic sealant In the ink cartridge from which the ink inside an ink container is drawn outside through the aforementioned ink supply needle It has the tape material which is

welded at the open end section side of the aforementioned tubed part material, and holds the aforementioned elastic sealant in tubed part material, the aforementioned tape material has the surface layer of this quality of the material mostly with the aforementioned tubed part material, and this surface layer is welded at tubed part material.

[0009] According to invention of a claim 1, the tape material welded at the open end section side of tubed part material has the surface layer of this quality of the material mostly with the aforementioned tubed part material, and the welding force between tape material and tubed part material is sharply heightened from this surface layer being welded at tubed part material compared with the case where the thing of the different quality of the material is used. Therefore, in case an ink supply needle is drawn out, even if an elastic sealant tends to fall out of tubed part material together with an ink supply needle with the adhesion of an ink supply needle and an elastic sealant and it is going to come out, it is regulated that an elastic sealant falls out and comes out by the high welding force by the tape material welded at the open end section side of tubed part material, and an elastic sealant is held in tubed part material as a result. Moreover, a sealing state is maintained over a long period of time, and mixing of the air to ink is prevented.

[0010] Invention of a claim 2 consists of material to which the surface layer of the aforementioned tape material and tubed part material make polypropylene a principal component in the ink cartridge of a claim 1.

[0011] According to invention of a claim 2, the surface layer of tape material and tubed part material are advantageous, when it is formed with the material which is excellent in ink-proof nature and ink is saved in high quality over a long period of time, while making polypropylene into a principal component and being mutually welded by the high welding force.

[0012] In the ink cartridge of a claim 2, further, the aforementioned ink container is formed in a flexible saccate, and invention of a claim 3 has the tapetum which becomes inner skin from the material which makes this quality of the material a principal component mostly with the surface layer of the aforementioned tape material, and is welded in this tapetum at tubed part material.

[0013] According to invention of a claim 3, not only between tape material and tubed part material but an ink container and tubed part material is had and combined by the high welding force, and an ink container is excellent in ink-proof nature.

[0014] In one ink cartridge of the claims 1-3, as for invention of a claim 4, the aforementioned elastic sealant makes rubber-like material of gas impermeability a principal component.

[0015] According to invention of a claim 4, sealing performance being secured and generating a foam in ink as a result by an elastic sealant being formed considering the rubber-like material of gas impermeability as a principal component, is stopped.

[0016] In one ink cartridge of the claims 1-4, as for invention of a claim 5, the length of the insertion direction of an ink supply needle is made into about 40 or less times of the thickness of tape material for the aforementioned elastic sealant.

[0017] According to invention of a claim 5, the length of the insertion direction of an ink supply needle is made into about 40 or less times of the thickness of tape material, and the elastic sealant is thinner [ the former ] than about 65 times. As mentioned above, since it is made to hold an elastic sealant certainly in tubed part material by tape material, even if it makes an elastic sealant thin and makes small frictional force with tubed part material, the omission of an elastic sealant can be prevented. Consequently, it becomes still more advantageous, when preventing the omission of the elastic sealant on which the drawing force smaller than before is made to act and which comes to be sufficient and is produced in the case of the drawing of an ink supply needle, in case an ink supply needle is drawn out. Moreover, the work which presses an elastic sealant fit in tubed part material also becomes easy, and becomes advantageous also on manufacture.

[0018]

[Embodiments of the Invention] In drawing 1 which shows outline composition, the ink bag body 2 which is the ink container with which ink is stored inside is contained in the enclosed-type-like cartridge case 3, and the ink cartridge 1 is constituted. The ink feed-holes section 4 is formed in the ink bag body 2, and this ink feed-holes section 4 is constituted by the tubed part material 5 which attachment fixation is carried out at a cartridge case 3, and it has focusing on ink feed-holes 5a, and the elastic sealant 6 (being 7mm in diametermm [ in thickness / 4 ], less than [ it ]) which is fitted in into ink feed-holes 5a of this tubed part material 5, and intercepts a free passage with the exterior of the ink bag body 2, and the interior

[0019] Moreover, to the end face by the side of the open end section of the aforementioned tubed part material 5, ink feed-holes 5a is covered, the tape material 7 is welded (for example, heat welding, ultrasonic welding), and the elastic sealant 6 is certainly held in the tubed part material 5 by this tape material 7.

[0020] and in case the ink supply needle 8 is connected to the above-mentioned ink cartridge 1 By making the ink supply needle 8 counter the ink feed-holes section 4 first, and moving an ink cartridge 1 in the direction of A, breaking

through the tape material 7 and the elastic sealant 6, and making it insert in ink feed-holes 5a of the tubed part material 5. Through the aforementioned ink supply needle 5a, the ink inside the ink bag body 2 draws outside, and is made into a possible state. In addition, the aforementioned ink supply needle 8 is connected to the print head of the printer which is not illustrated through the ink supply pipe 9.

[0021] As a detail is shown in drawing 2, the aforementioned elastic sealant 6 Larger major-diameter section 6a of an outer diameter than the bore of inner skin 5b of ink feed-holes 5a, By having narrow diameter portion 6b of a minor diameter, resisting the elasticity of major-diameter section 6a, and pressing the elastic sealant 6 fit in ink feed-holes 5a from this major-diameter section 6a. The periphery section of major-diameter section 6a and inner skin 5b of ink feed-holes 5a carry out elastic contact, seal nature is secured, and a free passage with the exterior of the ink bag body 2 and the interior is intercepted certainly.

[0022] As the aforementioned elastic sealant 6, it is ink impermeability and gas impermeability, and after extracting the ink supply needle 8, it is formed from the material of the shape of rubber which has the elastic stability which seals the insertion section. For example, isobutylene isoprene rubber or the material near it can be used.

[0023] Moreover, in order that the aforementioned tape material 7 may heighten the heat welding force over the tubed part material 5, it has surface-layer 7a of this quality of the material mostly with the aforementioned tubed part material 5, and this surface-layer 7a is welded at the end face by the side of the open end section of the tubed part material 5. It will be possible to use the material which specifically makes a principal component the polypropylene which is excellent in ink-proof nature as tubed part material 5, and the tape material 7 will have surface-layer 7a of this quality of the material mostly with it in that case.

[0024] Thus, since surface-layer 7a of the tubed part material 5 and the tape material 7 welded at it is mostly made into this quality of the material, to the tubed part material 5, surface-layer 7a of the tape material 7 will have them by the high welding force compared with the case where it considers as the thing of the different quality of the material, and will be joined.

[0025] Consequently, although an ink cartridge 1 will be moved in the direction of B and the ink supply needle 8 will be drawn out from the elastic sealant 6 and the tape material 7 if the ink residue in the ink bag body 2 is lost as shown in drawing 3. Although the elastic sealant 6 considers as the method of an omission together with the ink supply needle 8 in the case of this drawing, since the tape material 7 has and is welded by the high welding force to the tubed part material 5 as mentioned above, escaping together with the ink supply needle 8 by the tape material 7 is regulated, and it is held in the tubed part material 5.

[0026] Moreover, the aforementioned ink bag body 2 is a saccate which has flexibility, has the tapetum (not shown) which becomes the inner skin of that from the material which makes this quality of the material a principal component mostly with the tubed part material 5, and is welded in this tapetum at the periphery section of the tubed part material 5. Therefore, it is had and combined by the high welding force with between the tape material 7 and the tubed part material 5 between the tubed part material 5 and the ink bag body 2. In addition, it is also possible to be able to use the laminating thing [ made the unilateral the glue line and the nylon layer (external layer), and / layer / polypropylene / (tapetum) / a glue line a polyethylene tele phthalate layer, a glue line, and / order ] centering on an aluminium alloy layer, and to use the same thing as this for the side else as tape material 7 as the aforementioned ink bag body 2, for example.

[0027] In addition to it, length [ in / the insertion direction of the ink supply needle 8 / in the aforementioned elastic sealant 6 ] is made into about 40 or less times of the thickness (about 100 micrometers) of the tape material 7, and the former is thinner than about 65 times, and it is carried out. As mentioned above, since it has prevented that the elastic sealant 6 escapes from the tubed part material 5 by the tape material 7, even if it makes the elastic sealant 6 thin and makes small frictional force of the elastic sealant 6 and the tubed part material 5, the elastic sealant 6 does not escape from the tubed part material 5. Therefore, the drawing force at the time of drawing out the ink supply needle 8 can be made small. Moreover, it becomes advantageous, when the work pressed fit in the tubed part material 5 becomes easy and the elastic sealant 6 is manufactured.

[0028] By the way, next manufacture of the above-mentioned ink cartridge 1 is made like, and is made. First, after forming what welded [ ink / 2 ] the tubed part material 5 and carrying out vacuum distributive pouring of the ink through ink feed-holes 5a of the tubed part material 5, the elastic sealant 6 is pressed fit in ink feed-holes 5a under a vacuum. Then, a sealant 7 is welded [ of the open end section of the tubed part material 5 ] (for example, heat welding, ultrasonic welding), a cartridge case 3 is equipped, and it considers as an ink cartridge 1.

[0029] If constituted as mentioned above, as shown in drawing 4, as it has and goes to the position where the ink feed-holes section 4 counters the ink supply needle 8 and is shown in drawing 5, first an ink cartridge 1 By inserting in in ink feed-holes 5a through the tape material 7 and the elastic sealant 6, through the aforementioned ink supply needle 8, the ink of the ink bag body 2 interior can draw a part for the point of the ink supply needle 8 outside, and can make it a

possible state.

[0030] And although it is necessary to draw out the ink supply needle 8 when the ink in the ink bag body 2 is lost and a user removes an ink cartridge 1 Since the elastic sealant 6 in which the ink supply needle 8 is inserted has stuck to the ink supply needle 8, in connection with the ink supply needle 8 being drawn out, the elastic sealant 6 tends to escape from and come out of the tubed part material 5 together with the ink supply needle 8. At this time, as the edge of the elastic sealant 6 contacts the tape material 7 (surface-layer 7a side), the elastic sealant 6 falling out according to the welding force of the tape material 7 to the tubed part material 5, and coming out is regulated and it shows drawing 6 , only the ink supply needle 8 will fall out.

[0031] In the form of the aforementioned implementation, since the seal nature of the interior of the ink bag body 2 and the exterior is fully secured by only the elastic sealant 6, the tape material 7 Although what is necessary is to have only the function to prevent that the elastic sealant 6 falls out in case the ink supply needle 8 is drawn out, as tape material is equipped with an aluminium alloy layer and it has seal nature, it is the synergistic effect of tape material and an elastic sealant, and it is also still more possible to raise seal nature more.

[0032]

[Effect of the Invention] this invention is carried out with a form which was explained above, and does so an effect which is described below.

[0033] Since the tape material welded at the open end section side of tubed part material has the surface layer of this quality of the material mostly with the aforementioned tubed part material and it is made to tubed part weld this surface layer, invention of a claim 1 The thing of this quality of the material can be welded mostly, and the welding force between tape material and tubed part material can be heightened. Consequently, in case an ink supply needle is drawn out, it can prevent that an elastic sealant falls out together with an ink supply needle by regulation of tape material, and can hold certainly in tubed part material. Moreover, a sealing state can be maintained over a long period of time, and mixing of the air to ink is prevented.

[0034] The portion which touches ink is excellent in ink-proof nature, and it can save ink in high quality over a long period of time while being able to weld it mutually by the high welding force, since invention of a claim 2 forms the polypropylene which is excellent in ink-proof nature in the surface layer of tape material, and tubed part material using the material made into a principal component.

[0035] Since it is made to tubed part weld invention of a claim 3 in this inside layer as a flexible saccate which has the inside layer which becomes inner skin from the material which makes this quality of the material a principal component mostly with the surface layer of the aforementioned tape material about an ink container, not only between tape material and tubed part material but an ink container and tubed part material can be had and combined by the high welding force, and an ink container is excellent in ink-proof nature.

[0036] Invention of a claim 4 is that an elastic sealant is formed considering the rubber-like material of gas impermeability as a principal component, sealing performance is secured and generating air bubbles in ink as a result is stopped.

[0037] Invention of a claim 5 can prevent the omission of the elastic sealant produced in the case of the drawing of an ink supply needle, even if the former is thinner than about 65 times and the length of the insertion direction of an ink supply needle carries out an elastic sealant as mentioned above, as it becomes about 40 or less times of the thickness of tape material, since it is made to hold an elastic sealant certainly in tubed part material by tape material. Consequently, the drawing force of an ink supply needle may come to be small. Moreover, the work which presses an elastic sealant fit in tubed part material also becomes easy, and becomes advantageous also on manufacture.

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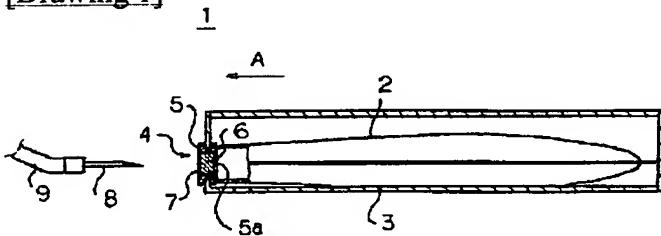
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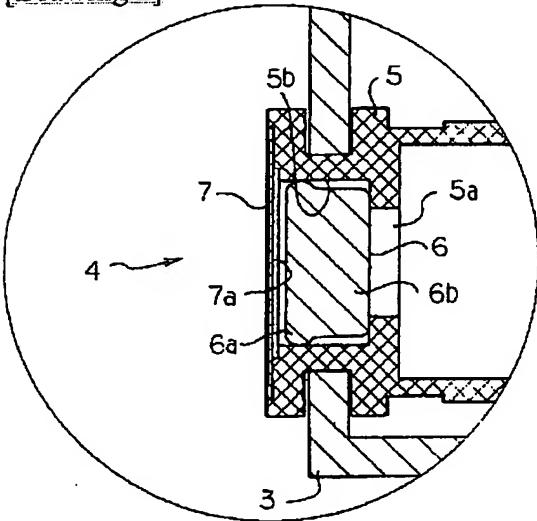
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## DRAWINGS

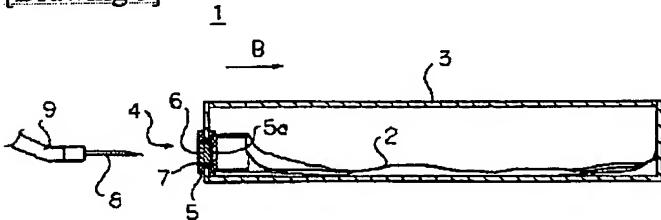
## [Drawing 1]



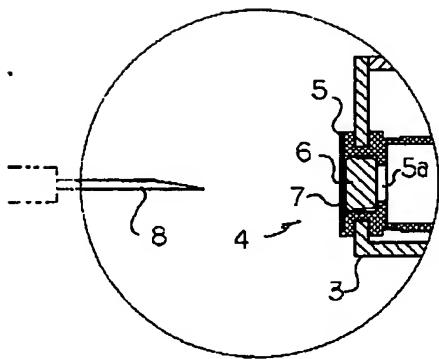
## [Drawing 2]



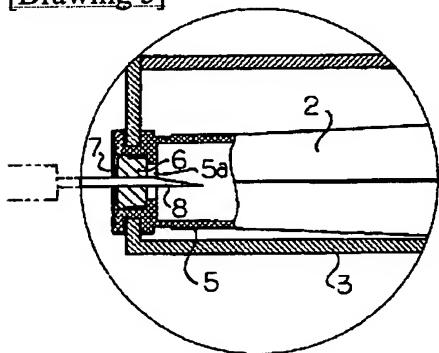
## [Drawing 3]



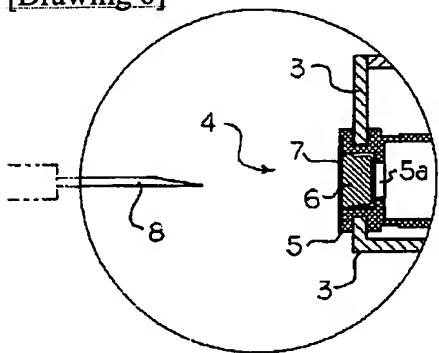
## [Drawing 4]



[Drawing 5]

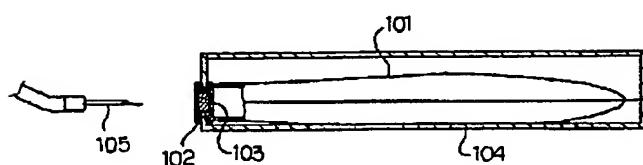


[Drawing 6]

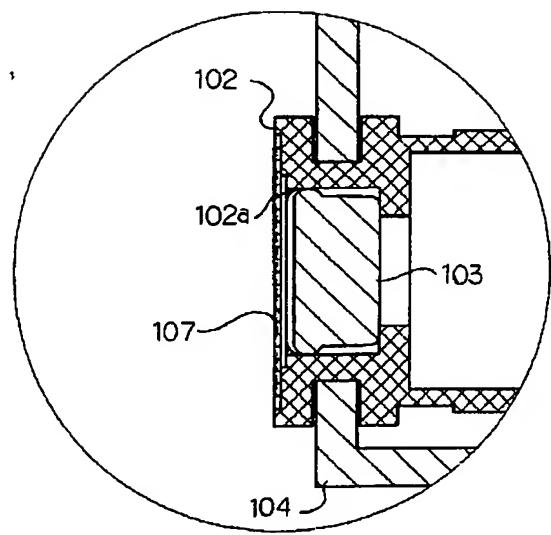


[Drawing 7]

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[Drawing 8]



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